

Phase sequence X 86 S<sub>A</sub> 91 N 111 I

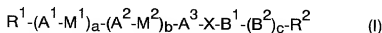
Phase sequecne X 41 N 79 I

Phase sequence X 74 N 89 I

15 Phase sequence X 61 S<sub>2</sub> 65 S<sub>C</sub> 89 N 112 I

# Patent claims

1. An active-matrix display containing a chiral smectic liquid-crystal mixture, wherein the liquid-crystal mixture comprises at least one compound of the formula (I)



where the symbols are as defined below:

$R^1$ ,  $R^2$  are, independently of one another, identical or different and are each

a) hydrogen, fluorine or CN

a straight-chain or branched alkenyl, alkenyloxy, alkyl or alkyloxy radical (with or without asymmetric carbon atoms) having 2 to 16 carbon atoms, where

b1) one or two nonterminal  $-CH_2-$  groups may be replaced by  $-O-$ ,  $-OC(=O)-$ ,  $-(C=O)-$ ,  $-C(=O)O-$ ,  $-\text{Si}(\text{CH}_3)_2-$ ,  $-\text{CH}(\text{Cl})-$  and/or one or two  $-CH_2-$  groups may be replaced by  $-\text{CH}=\text{CH}-$  or  $-\text{C}\equiv\text{C}-$

and one or more H atoms may be replaced by F and/or

b2) one or more  $-CH_2-$  groups may be replaced by phenylene-1,4-diyl (unsubstituted, monosubstituted or disubstituted by F), phenylene-1,3-diyl (unsubstituted, monosubstituted or disubstituted by F), cyclohexane-1,4-diyl (unsubstituted or monosubstituted by F or CN) or cyclopropane-1,2-diyl

and one or more H atoms may be replaced by F

with the provisos that only one of the radicals  $R^1$ ,  $R^2$  can be hydrogen, F or CN and that two adjacent  $-CH_2-$  groups cannot be replaced by  $-O-$

$M^1$ ,  $M^2$  are, independently of one another, identical or different and are each

$-\text{C}(=\text{O})\text{O}-$ ,  $-\text{OC}(=\text{O})-$ ,  $-\text{CH}_2\text{O}-$ ,  $-\text{OCH}_2-$ ,  $-\text{CF}_2\text{O}-$ ,  $-\text{OCF}_2-$ ,  
 $-\text{CH}_2\text{CH}_2-$ ,  $-\text{CF}_2\text{CF}_2-$ ,  $-\text{CH}=\text{CH}-$ ,  $-\text{CH}=\text{CF}-$ ,  $-\text{CF}=\text{CF}-$ ,  $-\text{C}\equiv\text{C}-$ ,  
 $-\text{CH}_2\text{CH}_2\text{C}(=\text{O})\text{O}-$ ,  $-\text{OC}(=\text{O})\text{CH}_2\text{CH}_2-$ ,  $-(\text{CH}_2)_4-$ ,

-OCH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>-, -CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>O-, -OCH<sub>2</sub>CF<sub>2</sub>CH<sub>2</sub>,  
 -CH<sub>2</sub>CF<sub>2</sub>CH<sub>2</sub>O- or a single bond

A<sup>1</sup>, A<sup>2</sup>, A<sup>3</sup> are, independently of one another, identical or different

5 and are each cyclohexane-1,4-diyl (unsubstituted or monosubstituted by F, CH<sub>3</sub>, CN), cyclohex-1-ene-1,4-diyl, cyclohex-2-ene-1,4-diyl, 2-oxocyclohexane-1,4-diyl, 2-cyclohexen-1-one-3,6-diyl, 1-alkyl-1-silacyclohexane-1,4-diyl, bicyclo[2.2.2]octane-1,4-diyl, spiro[4.5]decane-2,8-diyl, spiro[5.5]undecane-3,9-diyl, phenylene-1,4-diyl (unsubstituted, monosubstituted or disubstituted by CN, CH<sub>3</sub>, CF<sub>3</sub>, OCH<sub>3</sub>, unsubstituted, monosubstituted, disubstituted, trisubstituted or tetrasubstituted by F), phenylene-1,3-diyl (unsubstituted, monosubstituted or disubstituted by CN, CH<sub>3</sub>, CF<sub>3</sub>, OCF<sub>3</sub>, unsubstituted, monosubstituted, disubstituted, trisubstituted or tetrasubstituted by F), thiophene-2,5-diyl, thiophene-2,4-diyl, (1,3,4)-oxadiazole-2,5-diyl, (1,3,4)-thiadiazole-2,5-diyl, 1,3-thiazole-2,5-diyl, 1,3-thiazole-2,4-diyl, (1,3)-oxazole-2,5-diyl, isoxazole-2,5-diyl, indane-2,6-diyl, naphthalene-2,6-diyl (unsubstituted, monosubstituted or disubstituted by F or CN), 1,2,3,4-tetrahydronaphthalene-2,6-diyl, decaline-2,6-diyl, pyrimidine-2,5-diyl (unsubstituted or monosubstituted by F), pyridine-2,5-diyl (unsubstituted, monosubstituted or disubstituted by F), pyrazine-2,5-diyl (unsubstituted or monosubstituted by F), pyridazine-3,6-diyl, quinoline-2,6-diyl, quinoline-3,7-diyl, isoquinoline-3,7-diyl, quinazoline-2,6-diyl, 5,6,7,8-tetrahydroquinazoline-2,6-diyl, quinoxaline-2,6-diyl, 1,3-dioxane-2,5-diyl (unsubstituted or monosubstituted by CN), benzothiazole-2,6-diyl, piperidine-2,4-diyl, piperazine-1,4-diyl

B<sup>1</sup> is cyclohexane-1,4-diyl (unsubstituted, monosubstituted or disubstituted by F, CH<sub>3</sub>, CN), perfluorocyclohexane-1,4-diyl, cyclohex-1-ene-1,4-diyl, cyclohex-2-ene-1,4-diyl, 1-alkyl-1-silacyclohexane-1,4-diyl, bicyclo[2.2.2]octane-1,4-diyl, cyclopentane-1,3-diyl, cycloheptane-1,4-diyl, tetrahydrofuran-2,5-diyl, tetrahydrofuran-2,4-diyl, phenylene-1,4-diyl (unsubstituted, monosubstituted or disubstituted by CN, CH<sub>3</sub>, CF<sub>3</sub>, OCF<sub>3</sub>, unsubstituted, monosubstituted, disubstituted, tri-